GPS/GIS Technologies
Supplement 1.6

Importing GPS Data into GIS

From the Newton to ArcView 3.1

The Chihuahuan Desert Lab in Carlsbad uses **ArcView 3.1** for its GIS, the **Newton** with **FieldWorker Pro 2.0** for GPS, and the **GIS Import Wizard Pro** to transfer data from the Newton to the PC. Although other systems have similarities, actual procedures/steps may differ. If you are using programs other than ArcView 3.1, FieldWorker Pro 2.0 and the GIS Import Wizard Pro, refer to your user's manuals.

After correctly capturing your GPS data, you will want to export it into ArcView for further analysis. This procedure has been greatly simplified by Scientific Technologies Corporation in their *GPS Import Wizard* manual (www.stchome.com). Two versions of their program are currently available. *GPS Import Wizard Lite* is a free downloadable program. It contains the basic features to transfer your data, but does not have the bells and whistles that are contained in the *GPS Import Wizard Pro*.

Either program will successfully import your data so that GIS can properly use it. However, the *Pro Version* of *Import Wizard* contains two features that do not exist on the *Lite* version. First, the features that were imported are displayed by type in a list box with checkmarks. The user may decide which of the features go into the next theme to be created. Secondly, by clicking the Continue button, another screen appears that allows the user to provide a name for the theme, change the legend type and, if appropriate, which field will be used for the legend. This process can be repeated until all of the features are imported into their respective themes. This feature of *Import Wizard Pro* makes it possible to import the same features into different themes at the same time. These themes can then be combined with other information you may have already imported, downloaded from internet or extracted from CD's.

Preparing ArcView to Run the GPS Import Wizard (Pro) Program on the PC

Step	Procedure	Explanation
1	Turn on your PC and start ArcView.	There is a one-time procedure necessary to install the GPS Import Wizard (Pro) into ArcView. There should be an icon with a picture of the Newton on it (we will call this the **GPS Import Wizard activation button** from now on) either on the Project-GUI toolbar or the View-GUI toolbar of ArcView.
2		If the **GPS Import Wizard activation button** is present on your screen skip to step 7. If you have completed the one-time setup procedure, but the Newton icon does not show up on your toolbars, repeat steps 3-6 to get your **GPS Import Wizard activation button** with the

		picture of the Newton back on the toolbars of ArcView.
3	Click **File**.	
4	Click **Extensions**.	
5	Be sure there is a check in the box beside both **Dialogue Designer** and **GPS Import Wizard**.	
6	Click **OK**.	Now, you should see the **GPS Import Wizard activation button** with the picture of the Newton appear either on the Project-GUI toolbar or the View-GUI toolbar of ArcView.

Starting the GPS Wizard (Pro) from within ArcView on the PC

7	Click **GPS Import Wizard** activation button**.**	This will open the first screen of the GPS Import Wizard (*Pro*) giving you a choice of two functions that you can use the Import Wizard.
8	Select **Download a new data set from GPS**.	This will be the option needed to import data from your Newton.
9	Click **Continue** button.	The Download Process and data location dialog box will open. The PC will now be in the standby mode waiting for the Newton to communicate with it.

Connect the Newton and the PC

10	Connect the **Newton** to the **PC** using the appropriate cord.	You will need to know which port you are using on your **PC** to communicate with the **Newton** in order to properly configure the **GPS Import Wizard.**

Start FieldWorker Pro on the Newton

Step	Procedure	Explanation
11	Turn on the Newton.	Switch is on left side.
12	Tap the **Extras** icon.	Use the touch pen supplied with the unit. The word tap will be used in this document to mean actually taking the touch pen supplied with the unit and physically touching the screen and slightly pushing in on it with the end of the pen.
13	Tap **FW Pro** icon.	This starts the FieldWorker Pro.

Finding the Project to Export Data From on the Newton

Step	Procedure	Explanation
14	Tap the icon at the top of the screen directly to the right of the Project icon.	This will pull down a menu that will list all of the **Projects** containing data that are currently stored on the **Newton.**
15	Tap the name of the **Project** you wish to export data from.	This will open the **Project** so that you can now begin exporting the **Data** stored within the **Stations** of your selected **Project**.

Preparing the Newton for the Export Process on the Newton

16	Click **Station.**	This pulls down a menu with the following options: **New, Duplicate**, **Delete**, **Go to …**, **Import** and **Export**.
17	Click **Export**.	The **Export Data for "Your Project"** menu will pop up. You may export only selected data or all data. You will be shown the total number of stations that will be exported by default.
18	Check **Options** box to insure the settings are correct**.**	Under the **GPS Format** option, be sure that the **ArcView** format is selected from the pull down menu. Under the **Delimited by** option, be sure that the **Comma** option is selected. Under the **Many tables include** option, select **Station # & name.** Under **Connection at** be sure the baud rate is set to **9600**. Under **Flow Control**, select **None**. If you are using a PC, under the **To** option, select **DOS.** Under the **via** option, select **Serial**. These last two options will vary if you have a Mac or are using a PC Card to export your data through.
19	When all **Options** are selected, tap **Export** at the bottom of the screen.	The **Export box** will turn to a **dark color** indicating that the Newton is now ready to export data and is in the **standby mode** waiting on the PC.

Beginning the Transfer from the Newton to the PC (From the PC)

20	Click **Download**.	The **FieldWorker Connect Dialog Box** will appear.
21	Click **Show**.	This will allow you to adjust the settings for the FieldWorker Connect Program on the PC to match the settings on the Newton.
22	Use the pull down menu to **set the port settings** to connect to COM1.	If you are not using COM1, select the port where you connected the cable from the Newton. If you do not know which one you have the cable connected to, try each option until one works.
23	Use the pull down menu to set the **Baud rate to 9600**.	The baud rate must match the Newton's baud rate.

24	Use the pull down menu to set the data transfer protocol to **No flow control**.	The data transfer protocol must match the Newton's transfer protocol. Now the **PC is ready to begin** receiving data.
25	Click **Transfer**.	This is in the FieldWorker Connect Dialog box. Immediately you should hear a stream of **click, click, click** as each station is transferred from the Newton to the PC. You should also see a series of numbers scrolling on the screen of the PC. A new dialog box will pop up when the transfer is complete. It will say Success! The transfer is complete.
26	Click **OK**.	The dialog box will disappear.
27	Hit **Escape** or click **X** in the upper right hand corner of the FieldWorker Connect Dialog Box.	**Escape** is on the keyboard. **X** is located in the upper right corner of the dialog box. Either of these will close the FieldWorker Connect Dialog Box.
28	Click inside the **white box** underneath the phrase "Please provide a name for the files of this dataset."	Clicking inside this box will place the cursor inside the box. Now, type in the name that you want to call the set of data that you just imported.
29	Click **file button**.	A dialog box will appear asking you to **Please specify the location for a copy of the source data**. The default directory is c:\gpsimport. If you wish to use some other directory, browse to find it. It is recommended you use the default directory.
30	Click **OK**.	Data will be copied to the directory that you chose. Then you will be taken back to the previous screen where you originally named your data set. The **Continue** button will now be activated.
31	Click **Continue**.	You will see a blue box similar to a cursor move back and forth at the bottom right hand corner of the PC screen. When it stops, the **ImportReport** box will pop up. It will tell you information about the data you just imported such as: **Import of C:**\gpsimport\temp\source.dat **Date:** **Fields included:** **what type of shape file was created**, etc.
32	Click **OK**.	This will close the **ImportReport** box and open the "Collecting features for the themes Step 2 of 3" dialog box which displays the features of the data imported by type in a list box with check marks. If the data imported was collected as points, you will need to choose points to view your data. If the data imported was collected as lines, you will need to

		choose lines to view your data. If the data imported was collected as a polygon, you will have to choose polygon to view your data. Viewing your data by item allows the user to choose which of the features go into the next theme to be created. (See **Note #1 regarding Themes**.) By default, all data points will be checked. If you wish to omit any for a particular theme, uncheck them. You will figure out what is going on here after you import several sets of data.
33	Click **Continue**.	A new screen **Setting the legend for the themes Step 3 of 3** dialog box will pop up and you will be able to type in the Name of the Theme (as you want it to be displayed in ArcView), decide on the Legend Type, and, if appropriate, which field will be used for the legend. This process can be repeated until all features are imported into their respective themes. Thus, it is possible to import the same features into different themes at the same time. You will figure out what is going on here after you import several sets of data.
34	Click **Create Theme**.	You will be asked if you want to add the theme to the active view (the view currently open in ArcView).
35	Click **Yes**.	
36	Click **Done**.	This will exit you from the GPS Import Wizard and you will be back in ArcView. Your data should be visible on the screen of your PC for further analysis.

Note #1
Below is some background information on how ArcView uses these "shapes" when your data is imported into that program.

A **theme** is a distinct set of geographic features such as counties, streets, buildings or rivers, along with the attributes for those features. Themes can be created from a variety of data sources, including existing digital maps, images and tabular data files.

Theme features represent geographic objects (actual locations) using three basic **shapes** -- points, lines and polygons. These shapes actually comprise a set of vector coordinates representing real time data on the Earth's surface. For example, a theme may represent highways as lines, banks as points, and counties as polygons.

Theme features represent real world objects. Each feature has a location, a representative shape (point, line or polygon), and a symbol that helps to identify it and provide information about it. **Points** represent objects that have discrete locations and

are too small to be depicted as areas such as utility poles, wells, train stations and schools. **Lines** represent objects that have length but are too narrow to be depicted as areas, such as freeways, rivers, railroads and utility lines. **Polygons** represent objects too large to be depicted as points or lines, such as parcels, census tracts, sales territories, counties, states and countries.

In ArcView, there are **Symbols** for points, symbols for lines, and symbols for polygons. Symbols for points often look like the features they identify. For example, the symbol for a school may be a little red schoolhouse and the symbol for an airport may be a small plane. Line symbols include thick or thin lines, solid or broken lines, and may come in a variety of colors. Polygon symbols include the colors and patterns used to fill in polygon shapes. Some colors may have a natural connection to the objects they represent such as blue for oceans and green for parks, while other may not.

In ArcView, themes based on the **shapefile** format draw more quickly. You can edit a theme based on a shapefile. You can also create your own data using the shapefile format. **Spatial data** is the source for themes and will be collected by the GPS unit and imported into ArcView. Spatial data is geographic data that stores the locations and shapes of geographic features, along with attribute information describing what each feature represents. When data from the Newton is imported into ArcView, it enters the program as shapefiles. **Shapefiles** are ArcView's GIS file format for storing location and attribute information for a set of geographic features.